REMARKS/ARGUMENTS

I. Status of Claims

Claims 1-20 are pending of which claims 1, 6, 11 and 16 are independent. Applicants note with appreciation that claims 2-5, 7-10, 12-15 and 17-20 were indicated as being allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

II. Rejections under 35 U.S.C. §102(b)

Claims 1, 6, 11 and 16 are rejected under 35 U.S.C. § 102(b) as being anticipated by Tran (U.S. Patent No. 6,269,075) (hereinafter Tran).

Before discussing differences between the cited reference and the claimed subject matter, it is believed to be beneficial to give a brief overview of the claimed subject matter. In a direct sequence CDMA (DS/CDMA) system, a rake receiver is used for demodulating multi-path signals received from different paths. Multi-path signals have a time diversity effect in the sense that signal quality can be heightened when multi-path signals are combined. Because multi-path signals have different time delays associated with their respective paths, the rake receiver allocates a plurality of fingers to different paths in accordance with time delays.

As the time delay between the adjacent paths becomes greater and the power difference between the adjacent paths becomes smaller, the convergence of the respective path becomes easier. However, as the time delay between the adjacent paths gets smaller and the power difference between the adjacent paths becomes greater, an undesirable "fat finger phenomenon", referring to the phenomenon that several adjacent fingers end up tracking the same path, likely occurs in a conventional rake receiver.

The claimed subject matter is directed to an apparatus and method aiming to solve the above-mentioned "fat finger phenomenon". Independent claim 1 recites such an apparatus comprising:

> the fingers, each <u>receiving timing control signals generated from other fingers in order to track the allocated multi-path signals</u> and tracking the multi-path signal allocated to the corresponding finger by

> selecting any one of the timing control signals of other fingers and an internal timing control signal in accordance with code tracker selection signals; and
>
> a controller for receiving the timing control signals from the fingers, and outputting the code tracker selection signals corresponding to the respective fingers in accordance with differences among time delays being tracked by the fingers allocated with adjacent path signals. (emphasis added).

Claims 6, 11 and 16 contains similar recitations.

In contrast, Tran, the cited reference, though also related to a rake receiver in a CDMA system, is directed to the very different subject matter of improving initial assignment of fingers as well as updating of finger assignments in a rake receiver without increasing hardware complexity. See abstract and col. 2, lines 63-67. The problem that Tran aims to solve relates to timing misalignment between the received signal and the internal timing control of the finger assigned to receive the signal. See col. 2, lines 7-16 and col. 2, lines 30-37. When a "searcher" component of a rake receiver decides to assign a particular multi-path to a particular finger, the decision is made based on the extent of coincidence between the arrival of the multi-path and the internal time control of the assigned finger. See col. 2, lines 7-16. Because the searcher usually has a relatively low time resolution and the finger assigned uses the same time resolution, degradation in performance occurs if the timing misalignment is excessive. See col. 2, lines 36-43.

To address this problem while not increasing the complexity of hardware, Tran discloses a scheme which uses quadratic approximation to derive a timing offset having a resolution higher than the predetermined timing resolution of the searcher. See abstract, Fig. 4, col. 4, lines 61-65 and col. 9:34 – col. 10:8. Given Tran's entirely different objective, Tran's scheme, however, fails to teach or suggest the claimed apparatus. Nonetheless, the Examiner points to fingers 16, as disclosing the fingers as claimed, and points to timing/control unit 52, as disclosing the controller as claimed. Applicant respectfully disagrees.

The Examiner alleges fingers 16 as disclosing the fingers recited in the claims. Specifically, with respect to fingers 16, the Examiner points to Fig. 1 and refers to

timing/control unit 52, which is a component of an individual finger 16, as receiving timing control signals 90 generated from other fingers. However, Fig. 1 does not show timing/control unit 52 receiving timing control signals from other fingers. It only shows timing/control unit 52 receiving the time control signal from the very code tracking loop 88 of its own host finger. To be more specific, it is unambiguous that timing/control unit 52 only receives two inputs, namely signal 90 (referred to as "tracking adjustment signal" in Tran) generated from its very own host finger's code tracking loop 88, and signal 100 (referred to as "finger assignment signal" in Tran) generated from finger assignment & control unit 20. Signals 90 generated from other fingers, *though could arguably be confused as going into a timing/control unit 52 of an individual finger if not looked carefully*, is not shown to go into the timing/control unit 52 as inputs. Accordingly, Tran does not disclose, teach, or suggest fingers, **each receiving timing control signals generated from other fingers** in order to track the allocated multi-path signals and tracking the multi-path signal allocated to the corresponding finger by selecting any one of the timing control signals of other fingers and an internal timing control signal in accordance with code tracker selection signals, as recited in claim 1 and similarly recited in claims 6, 11 and 16.

The Examiner further alleges that timing/control unit 52 as disclosing the controller recited in the claims. Specifically, with respect to timing/control unit 52, the Examiner points to Fig. 1 as disclosing receiving alleged timing control signal 90 from other fingers and outputting the alleged code tracker selection signal corresponding to the respective fingers in accordance with differences among tracked time delays. However, as discussed above in great detail, timing/control unit 52 only receives two inputs, namely signal 90 and signal 100, and thus does not receive timing control signals from the fingers, as claimed. Furthermore, timing/control unit 52 does not generate the code tracker selection signals as claimed. Instead, it generates sample timing signal 50 for on-time samples 48I and 48Q. Accordingly, Tran does not disclose, teach, or suggest a controller **for receiving the timing control signals from the fingers**, and **outputting the code tracker selection signals** corresponding to the respective fingers in accordance with differences among time delays being tracked by

the fingers allocated with adjacent path signals, as recited in claim 1 and similarly recited in claims 6, 11 and 16.

Further, though not alleged by the Examiner, it appears that the finger assignment and control unit 20 of Tran could also arguably correspond to the claimed controller. The finger assignment and control unit 20, however, likewise fails to disclose, teach, or suggest a controller for receiving the timing control signals from the fingers, and outputting the code tracker selection signals corresponding to the respective fingers in accordance with differences among time delays being tracked by the fingers allocated with adjacent path signals, as claimed.

Specifically, referring to from col. 7, line 64 to col. 8, lines 9 of Tran, finger assignment and control unit 20 of the cited reference generates initial finger assignment signal and reads sequences of measurements taken by searcher unit 18. These sequences represent multipath profiles or signal amplitudes of the RF signal as a function of timing offset. In addition, finger assignment and control unit 20 process multipath profiles for data reduction and identifies the best candidate multipaths of the RF signal to demodulate. Since the amplitude reflects signal strength, the best candidate multipath is that path with the largest amplitude. In previous CDMA rake receivers, the peak location of the best candidate path determined by the searcher unit was used to make the initial finger assignment.

Nonetheless, there is no description of finger assignment and control unit 20 for receiving the timing control signals from the fingers, and outputting the code tracker selection signals corresponding to the respective fingers in accordance with differences among time delay being tracked by the fingers allocated with adjacent path signals, as recited in claim 1 and similarly recited in claims 6, 11 and 16 with respect to the claimed controller.

Consequently, it is respectfully submitted that Tran does not disclose, teach, or suggest the subject matter recited in claims 1, 6, 11 and 16. Accordingly, reconsideration and withdrawal of the rejection of claim 1, 6, 11 and 16 is respectfully requested.

Allowable Subject Matter

Applicants thank the Examiner for allowing the subject matter recited in claims 2-5, 7-10, 12-15 and 17-20 while objecting the claims for their current dependent form. In view of the above stated remarks and arguments stated in connection with the rejection of claims 1, 6, 11 and 16, Applicants believe that claims 2-5, 7-10, 12-15 and 17-20 are in condition for allowance in their current dependent form by virtue of their dependence from claims 1, 6, 11 and 16, respectively. Accordingly, Applicants respectfully hold amending these claims into dependent form in abeyance until the Examiner has had an opportunity to consider the above comments.

III. Conclusion

In view of the above, it is believed that the application is in condition for allowance and notice to this effect is respectfully requested. Should the Examiner have any questions, the Examiner is invited to contact the undersigned at the telephone number indicated below.

Respectfully Submitted,

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